S.E. Comp. sem III CBGS NOV-13

Sub:- EC & CF

29/11/13

2nd Half-13(9)-PKL-21

Con. 7891-13. **GX-12080**

(3 Hours) **[Total Marks : 80**

N. B. : (1) Question No. **1** is **compulsory**.
(2) Solve any **three** questions out of the remaining questions.
(3) Draw neat and clean **diagrams**.
(4) Assume any suitable data required.

1. (a) What do you understand by "Pinch off" voltage and "cut off" voltage as applied to FET? **5**
(b) With neat block diagram explain how PLL can be used to generate large number of frequencies from a single reference frequency. **5**
(c) For an FM radio receiver, when the consumer changes the chanel, the oscillator frequency changes. The fequency of radio signal coming out of the mixer will be always be 10.7 MHz regardless of the channel selected. If the oscillator frequency is 99.2 MHz. What is the frequency of station selected? If a Hartley tuned oscullator is being used with a variable capacitor in the LC tank circuit, what is the valve of capacitance if the total inductance is 2.5μH. **5**
(d) Optical sensor of a package counting system create 1.5 V DC signal when it detects the seal. This voltage need to be amplified and sent to a controller with an input resistance of 5KΩ. Draw block diagram for the system. Choose correct amplifier to drive this low resistance load and select the resistor valves to set the gain. The input voltage range for the controller is +10V to +30V DC. **5**

2. (a) Determine the V_{GSQ}, I_{DQ} and V_{DSQ} and A_V for a voltage divider ciruit with $V_{DD} = 18_V$, $R_D = 2.2K$, $R_1 = 2.1M$, $R_2 = 330K$ and $R_S = 1.2$ K, $I_{DSS} = 10mA$, $V_P = -8V$ and $V_{DS} = 40\mu s$. **10**
(b) Explain how Op-Amp can be used as a summing, scaling and averaging amplifier in the everting confeguration. **10**

Inverting configuration

3. (a) Sketch an op-amp integrating circuit together with the circuit waveforms. Explain in brief the circuit operation. **5**
(b) Explain the fly wheel effect in class c amplifier. **5**
(c) Explain why crystal oscillators are considered to be moe stable than other oscillators. **5**
(d) Compare different biasing circuits with respect to Q-point? Comment on which biasing circuit is better in stability. **5**

Cancellation

4. (a) Draw the block diagram of a phase concellation SSB generation and explain how the carrier and unwanted side band are suppressed. What change is necessary to suppress the other side band. **10**
(b) Draw foster Seeley Descriminator with ciruit diagram and explain its working with phasor diagrams. **10**

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5. (a) What is multiplexing in communication system? Draw block diagram of TDM-PCM system and explain? **10**

   (b) One input to a conventional AM modulator is a 500 KHz carrier with an amplitude of 20 V_p. The second input is a 10 KHz modulating signal that is of sufficient amplitude to cause a change in the output wave of ± 7.5V_p. Determine **10**

   (i) Upper and lower side frequences

   (ii) Modulation coefficient and percent modulation

   (iii) Peak amplitude of the modulated carrier and upper and lower side frequency voltages

   (iv) Expression for the modulated wave

   (v) Draw the output spectrum.

6. (a) What are the drawbacks of Data modulation and how are they overcome by ADM? **5**

   (b) Explain in brief the principle of super heterodyne receiver? **5**

   (c) Compare PAM, PPM & PWM. **5**

   (d) What is meant by Nyquist rate in sampling? What is standard frequency for speech signal. **5**
